

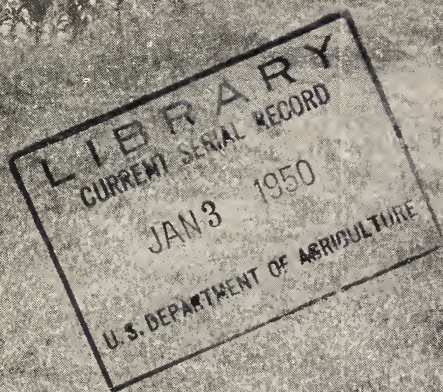
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Grass WATERWAYS



LEAFLET No. 257
U. S. DEPARTMENT OF AGRICULTURE

GRASS WATERWAYS

By HARRY H. GARDNER, *Chief, Agronomy Division*, and EDWIN FREYBURGER, *Chief, Engineering Division, Upper Mississippi Valley Region, Soil Conservation Service*

During heavy rains more water falls on nearly all cropland than can be held by the best crop rotations, contour farming, strip cropping, or even terraces. This water will run off through some kind of waterway. Unless you provide a safe waterway, it probably will cut a gully. Usually it is easiest and cheapest to use a natural depression for a grass waterway to carry the water away safely (fig. 1). On some farms there is no natural depression that can be used, and a waterway must be constructed in some other place.

Any grass waterway that is to carry extra water safely must be designed to take care of all rains. It must be made right. Its grass cover must be dense enough to keep water from running on bare soils. And it must be kept in good condition year after year.

This leaflet will deal only with the use of grass as a lining for the waterway. We will assume that the waterway has the right shape, size, and slope according to the amount of water it must carry and that it is located in the right place in the field. If you need help in solving particular problems on your own farm, go to the governing board of your local soil conservation district.



Figure 1.—An excellent bluegrass-sod grass waterway in a natural depression. This waterway was once a gully.



Figure 2.—Well-planned grass waterways produce an income as well as protect their drainage areas. The second cutting of hay is being harvested on this Illinois farm.

° WATERWAYS ARE NOT WASTE AREAS

Carrying extra water away safely is not the only way a grass waterway can serve you. If carefully made and managed, these waterways will more than pay their way in added income. Many are handled as regular hay fields (fig. 2). Others, especially in the South, produce grass or legume seed for use on the farm or for sale. All of them can be pastured at certain times of the year. And pasturing if properly done has the added advantage of improving the sod.

USE RIGHT KIND OF GRASS

In selecting a grass you must consider how deep and how dense its root system will be. Choose a grass that grows thick on the ground and one that will lie flat under running water and rise back up when the run-off stops. And of course the grass must be suited to your soil and climate.

Kentucky bluegrass is an ideal grass for channels in soils that are high in organic matter. It has a dense root system that grows close to the surface and the top growth is moderately short and thick.

Chewings fescue is similar to bluegrass and, in addition, will grow on soils low in organic matter, such as sands. Timothy is well adapted to a wide range of soil conditions. But it is a bunchgrass and must be used with other grasses such as red top to form a thick sod. Brome-grass has a root system that is deeper than bluegrass but not so dense. It is particularly well suited to deep, fertile soil.



Figure 3.—Preparing a good seedbed is the key to getting a healthy stand of grass in waterways. Disks, spike-toothed harrows, and cultipackers are useful tools.

Tall fescues are excellent wet-land grasses that stand up under a heavy flow of water. Reed canarygrass will also grow in wet soils but should be used only where there is a deep, well-defined waterway. It is not suited to shallow waterways. Its tall, dense growth causes silting which makes a dam across the waterway. These dams may force the water out of the designed channel or make it meander back and forth in the channel.

PREPARE A GOOD FIRM SEEDBED

Preparing a good seedbed is the key to getting a good stand of grass in the waterway (fig. 3). If you are seeding the field to meadow you can prepare the seedbed for the waterway at the same time, using the same tools. In terrace outlets and other specially built channels, however, you will need to do some extra work.

If you have barnyard manure you should put on 10 to 20 spreader loads per acre. Work it into the soil thoroughly. You may be able to do this by disking alone. Usually you will get better results by plowing the channel after you have worked the manure into the surface 3 or 4 inches with the disk. The lime that's needed, usually 1 to 2 tons per acre, can be worked into the soil in the same operation. After these things are done the waterway seedbed must be made firm and even. Young plants must have a firm soil for their roots if they are to live through periods of unfavorable growing conditions. This smoothing and firming can be done with a disk, spike-tooth harrow,

and cultipacker. When the soil is so firm that you can hardly see your footprints, it is ready for seeding.

USE GOOD SEED

High quality, live seed is a necessity. Use two or three times more seed than you ordinarily use for meadows. The seed must be sown shallow— $\frac{1}{4}$ to $\frac{1}{2}$ inch deep if you use a drill, and on top of the ground if you seed by hand. (The mulch spread right after seeding will keep the seed in place.)

SEED A SIMPLE MIXTURE

The seed mixture should be simple, that is contain only a few kinds of seed. In fact, one grass with a short-lived companion crop usually is enough. Where a number of grasses having different growth habits are used they may compete with each other until the plants of some of the species are weakened. In many places it is not advisable to use a legume. But in the South, kudzu and sericea lespedeza make excellent waterways. Caley peas and reseeding crimson clover are also used as winter legumes on summer grasses.

USE FERTILIZER TO GET GRASS STARTED

You will need to use more fertilizer than you do for most field crops to get grass well started in waterways. Since the area occupied by the waterway is not large, the fertilizer cost will not be excessive.

If you use a drill, the fertilizer can be applied with a fertilizer attachment. When the seed is to be broadcast, the fertilizer can be broadcast during the smoothing and firming process ahead of seeding.

MULCH AFTER SEEDING

After seeding, spread a light mulch at the rate of 2 tons per acre. Use strawy manure, a stack bottom, or even straw for the mulch. Then cultipack the waterway again to cover the seed and to press the mulch into the soil.

SEED IN EARLY SPRING OR LATE SUMMER

Successful grass seedings can be made only at certain times of the year—early spring or late summer. (Get the dates for your locality from your local soil conservationist.)

If the waterway has been completed at these times then seed it immediately. If the waterway has been completed at a time of year when it is not a good time to seed grass (too late in the spring for a spring seeding, or too late in the fall for a late summer seeding) the waterway should be seeded with a stabilizing crop to prevent damage from rains. Sudan grass, oats, or rye can be used in the



Figure 4.—A, Corn, sown at the rate of 2 to 3 bushels to the acre, protected this waterway until it was time to seed the grass. B, The temporary channels along the edge will cut off the run-off from the field until the grass is well established.

spring, or corn, 2 to 3 bushels per acre (fig. 4, A). For a fall stabilizing crop use oats, rye, or ryegrass.

For fall seeding cut the stabilizing crop 4 to 8 inches high and remove any surplus top growth. This may later be used as a mulch after seeding. Then seed the grass mixture with a drill, or broadcast and cultipack. If the ground is dry and hard it may be necessary to disk before seeding.

PROTECT THE WATERWAY WHILE THE GRASS IS GETTING STARTED

Start protecting the waterway as soon as you have it seeded. Keep the water that falls on the rest of the field from flowing down the waterway while the young grass is getting started. In other words,

until the seeding is well established, no water should be allowed to flow over the grass except that which falls directly upon it (fig. 4, *B*).

USE FERTILIZER AND MANURE TO KEEP GRASS STRONG

Apply nitrogen fertilizer or concentrated manure to the waterway often enough to maintain a dense sod. How often this is needed will depend on the soil, the location, and many other factors, but the objective is to have a healthy, dense sod.

Keep the grass in the waterway short if it is not to be mowed for hay or used for seed. A short, dense top growth of grass will carry more water without injury to the waterway than tall mature grass with stiff seed stalks. You can harvest seed from some waterways. But remember that many types of grasses provide less protection against washing when the grass is allowed to produce seed. For this reason, grass in waterways carrying heavy flow should not be allowed to produce seed. And animals, especially hogs, should never have free access to waterways.

REPAIR WHEN NEEDED

If the grass lining of the waterway becomes damaged, repair it immediately. It will be easy when the damage is small. Each rain increases the damage and the cost and labor of putting it back in good condition.

Rills and small gullies may develop in a waterway when there is heavy runoff even when perfect seedings are established (fig. 5).

They are often started by some obstacle such as a rock, a broken tree limb, or weeds that cause the water to concentrate in one place and cut through the sod. Such obstacles must be removed and the



Figure 5.—The gully in this waterway could have been prevented by placing a little sod in the right place at the right time.



Figure 6.—Plowing should be done at right angles to a waterway and plows should be lifted and disks straightened when crossing a waterway.

scar filled. If the hole is more than 3 or 4 inches deep, soil should be tamped firmly and then sodded with good live sod which also should be tamped in place.

Always lift plows and straighten disks when crossing the waterway (fig. 6). Plow at right angles to the waterway; never plow parallel to it. This will prevent water running along the side and starting a gully.

Remember, the waterway is the most critical part of your water disposal system. If it fails the rest of the system is badly weakened.

SUMMARY

1. Prepare a firm seedbed using such implements as necessary to do a thorough job.
2. Apply 10 to 20 spreader loads of manure per acre.
3. Lime and fertilize as needed.
4. Seed the right kind of grass at the proper time, using good live seed.
5. Apply mulch immediately after seeding.
6. Protect from washing until the seeding becomes established.
7. Repair all breaks immediately with soil and sod.
8. Top dress with nitrogen fertilizer to maintain a dense sod.
9. Clip or graze to maintain a short, dense top growth.

Issued December 1949.

U. S. GOVERNMENT PRINTING OFFICE: 1949

For sale by the Superintendent of Documents, U. S. Government Printing Office
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